

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Group Art Unit: 1773
Gary R. McLuen et al.	)	Examiner: Handy, Dwayne K.
Serial No.: 09/742,803	)	
Filed: 12/19/2000	)	<b>APPEAL BRIEF</b>
For: <b>MULTI-WELL ROTARY SYNTHESIZER</b>	)	162 North Wolfe Road
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Commissioner for Patents  
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Alexandria, VA 22313-1450

Sir:

In furtherance of the Applicants' Notice of Appeal filed on August 3, 2011, this Appeal Brief is submitted. This Appeal Brief is submitted in support of the Applicants' Notice of Appeal, and further pursuant to the rejection mailed on February 15, 2011, in which Claims 27-30, 35-38, 40, 42, 44-48 and 50-62 were rejected. The Applicants submit this Appeal Brief to the Board of Patent Appeals and Interferences in compliance with the requirements of 37 C.F.R. § 41.37, as stated in *Rules of Practice Before the Board of Patent Appeals and Interferences (Final Rule)*, 69 Fed. Reg. 49959 (August 12, 2004). The Applicants contend that the rejections of Claims 27-30, 35-38, 40, 42, 44-48 and 50-62 in this proceeding are in error, were previously overcome and are overcome again by this appeal.

**I. REAL PARTIES IN INTEREST**

As the assignee of the entire right, title, and interest in the above-captioned patent application, the real parties in interest in this appeal, is:

McLuen Design Inc., a corporation of the State of Washington  
2023 Sims Way, #321  
Port Townsend, WA 98368

per the assignment document filed on May 25, 2004.

**II. RELATED APPEALS AND INTERFERENCES**

The Applicants are not aware of any other appeals or interferences related to the present application.

**III. STATUS OF THE CLAIMS**

Claims 27-30, 35-38, 40, 42, 44-48 and 50-62 are involved in the appeal. Claims 1-26, 31-34, 39, 41, 43 and 49 have previously been canceled. Claims 27-29, 35-38, 40, 42, 44, 52 and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,368,823 to McGraw et al. (hereinafter “McGraw,” a copy of which is attached as Exhibit A). Claims 27-29, 35, 36, 38, 45-48, 50-54, 56, 57 and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,240,680 to Zuckermann et al. (hereinafter “Zuckermann,” a copy of which is attached as Exhibit B). Claims 27-30, 35, 36, 38, 45-48 and 50-62 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,609,826 to Cargill et al. (hereinafter “Cargill,” a copy of which is attached as Exhibit C). Claims 27-30, 35-38, 40, 42, 44-48, and 50-62 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 35-55 of the co-pending U.S. Patent Application No. 12/154,880.

**IV. STATUS OF DOUBLE PATENTING REJECTION**

A terminal disclaimer was filed on March 25, 2011 in order to obviate the need for the double patenting rejection.

**V. STATUS OF THE AMENDMENTS FILED AFTER FINAL REJECTION**

No amendments have been filed after the Office Action mailed on February 15, 2011.

**VI. SUMMARY OF CLAIMED SUBJECT MATTER**

The invention disclosed in the present application number 09/742,803 is directed to an apparatus for synthesizing polymer chains includes a controller, a plurality of precision fit vials circularly arranged in multiple banks on a cartridge, a drain corresponding to each bank of vials, a chamber bowl, a plurality of valves for delivering reagents to selective vials, and a waste tube system for purging material from the vials. A purging operation can be selectively performed on one or more of the banks of vials. The multiple banks of valves provide an additional number of reagent choices while operating in a serial mode and faster reagent distribution while operating in a parallel mode. The plurality of vials are stored in the cartridge and are divided among individual banks wherein each bank of vials has a corresponding drain. There is at least one waste tube system for expelling the reagent solution from vials within a particular bank of vials when the waste tube system is coupled to the corresponding drain. The cartridge holding the plurality of vials rotates relative to the stationary banks of valves and the waste tube system. The controller rotates the cartridge and operates the banks of valves and the waste tube system in response to the required sequence of dispensing various reagent solutions and flushing appropriate vials in order to form the desired polymer chain within each vial.

The elements of Claim 27, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprising an exterior support and a bored interior (630) having a consistent dimension to hold a frit (620) for retaining material within the vial (181) directly above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above the frit (620) after the flushing procedure, wherein the bored interior (630) linearly tapers from the exterior support to the frit (620).

The elements of Claim 29, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge (170) thereby providing a pressure-tight seal directly between the vial (181) and the cartridge (170), a bored interior (630) having a consistent dimension to maintain a consistent flow through the bored interior (630) during flushing procedures by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above a frit (620) after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 35, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises a bored interior (630) having a consistent dimension to hold a frit (620) for retaining material above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181), a top opening (610) through which material is dispensed into the bored interior (630), a bottom opening (640) of a diameter to retain material within the bored interior (630) when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge (170) to form a pressure-tight seal directly between the vial (181) and the cartridge (170) when the vial (181) is inserted into a receiving hole of the cartridge (170), wherein the outer wall continuously tapers from the top opening (610) to the bottom opening (640) and a solid support (650) retained within the vial (181) above the frit (620) after the flushing procedure.

The elements of Claim 36, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises a frit (620), a solid support (650) and a body comprising a bored interior (630) having a consistent dimension to hold the frit (620) for retaining the solid support (650) above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing

procedure by only forming a pressure differential to expel material from the vial (181), wherein the solid support (650) and material formed on the solid support (650) is retained above the frit (620), within the vial (181), during a flushing procedure, a top opening (610) through which material is dispensed into the bored interior (630), a bottom opening (640) of a diameter to retain material within the bored interior (630) when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge (170) to form a pressure-tight seal directly between the vial (181) and a cartridge (170) when the vial (181) is inserted into a receiving hole of the cartridge (170) and an interior wall, wherein the internal wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 45, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) including an interior wall and a bored interior (630) having a consistent dimension to hold a frit (620), the vial (181) consisting essentially of a single frit (620) for retaining material within the vial (181) directly above the single frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above the single frit (620) after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit (620).

The elements of Claim 46, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge (170) thereby providing a pressure-tight seal directly between the vial (181) and the cartridge (170), a bored interior (630) having a consistent dimension to maintain a consistent flow through the bored interior (630) during flushing procedures by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) directly above a frit (620), the vial (181) consisting essentially of a single frit (620), after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 47, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises an interior wall, a bored interior (630) having a consistent dimension, a material for growing a polymer chain and a frit (620) for retaining the material within the vial (181) directly above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above the frit (620) after the flushing procedure, the vial (181) consisting essentially of a single frit (620), wherein the interior wall linearly tapers from an exterior support to the frit (620).

The elements of Claim 48, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises an interior wall and a bored interior (630) having a consistent dimension to hold a frit (620), the vial (181) consisting essentially of a single frit (620) for retaining material within the vial (181) directly above the single frit (620) without any additional frits (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above the single frit (620) after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit (620).

The elements of Claim 50, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The plurality of vials (181) each comprising an interior wall and a bored interior (630) having a consistent dimension to hold a frit (620), wherein the consistent dimension is consistent for each of the plurality of vials (181), each of the vials (181) consisting essentially of a single frit (620) for retaining material within the vial (181) directly above the single frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained

within the vial (181) above the single frit (620) after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit (620).

The elements of Claim 51, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The plurality of vials (181) each comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge (170) thereby providing a pressure-tight seal directly between the vial (181) and the cartridge (170), wherein the exterior dimension is consistent for each of the plurality of vials (181) such that any of the vials (181) will consistently fit within the receiving hole of the cartridge (170), each of the plurality of vials (181) further comprising a bored interior (630) having a consistent dimension to maintain a consistent flow through the bored interior (630) during flushing procedures by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) directly above a frit (620), the vial (181) consisting essentially of a single frit (620), after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 52, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The plurality of vials (181) comprise a bored interior (630) having a consistent dimension to hold a frit (620) for retaining material above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181), wherein the consistent dimension is consistent for each of the plurality of vials (181), a top opening (610) through which material is dispensed into the bored interior (630), a bottom opening (640) of a diameter to retain material within the bored interior (630) when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge (170) to form a pressure-tight seal directly between the vial (181) and the cartridge (170) when the vial (181) is inserted into a receiving hole of the cartridge (170), wherein the exterior dimension is consistent for each of the plurality of vials (181) such that any of the vials (181) will consistently fit within the receiving hole of the cartridge (170), a solid support (650) retained within the vial

(181) above the frit (620) after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 53, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The plastic vial (181) comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge (170) thereby providing a pressure-tight seal directly between the vial (181) and the cartridge (170), a bored interior (630) having a consistent dimension to maintain a consistent flow through the bored interior (630) during flushing procedures by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above a frit (620) after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 56, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The plastic vial (181) comprising a bored interior (630) having a consistent dimension to hold a frit (620) for retaining material above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181), a top opening (610) through which material is dispensed into the bored interior (630), a bottom opening (640) of a diameter to retain material within the bored interior (630) when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge (170) to form a pressure-tight seal directly between the vial (181) and the cartridge (170) when the vial (181) is inserted into a receiving hole of the cartridge (170), a solid support (650) retained within the vial (181) above the frit (620) after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit (620).

The elements of Claim 59, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The molded polyethylene compressible vial (181) comprises an interior wall and an exterior



compressible dimension to compressibly fit directly within a receiving hole of a cartridge (170) thereby providing a pressure-tight seal directly between the vial (181) and the cartridge (170), a bored interior (630) having a consistent dimension to maintain a consistent flow through the bored interior (630) during flushing procedures by only forming a pressure differential to expel material from the vial (181) and a solid support (650) retained within the vial (181) above a frit (620) after flushing procedures, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit (620).

The elements of Claim 60, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The molded polyethylene compressible vial (181) comprises a bored interior (630) having a consistent dimension to hold a frit (620) for retaining material above the frit (620) and maintain a consistent flow through the bored interior (630) during a flushing procedure by only forming a pressure differential to expel material from the vial (181), a top opening (610) through which material is dispensed into the bored interior (630), a bottom opening (640) of a diameter to retain material within the bored interior (630) when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior compressible dimension to compressibly fit directly within a receiving hole of a cartridge (170) to form a pressure-tight seal directly between the vial (181) and the cartridge (170) when the vial (181) is inserted into a receiving hole of the cartridge (170), a solid support (650) retained within the vial (181) above the frit (620) after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit (620).

The elements of Claim 61, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 25 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises a top opening (610), a bottom opening (640), a precision bored interior (630) that holds a frit (620), providing a consistent compression and seal with the frit (620) and provides a consistent flow of a reagent solution through the vial (181) during a dispensing and a purging process, a solid support (650) within the vial (181) that is retained above the frit (620) after the purging process and a support that has a precise dimension that provides a pressure tight

seal around the vial (181) when the vial (181) is placed in a cartridge (170), an interior wall, wherein the interior wall linearly tapers from the support to the frit (620).

The elements of Claim 62, directed to one embodiment of the present invention, are described in the Specification at page 3, line 24 to page 4, line 2; page 5, line 19 to page 6, line 2; page 7, lines 1-7; page 7, line 17 to page 8, line 7; page 12, lines 18-20; page 13, line 20 to page 14, line 11; page 15, line 24 to page 16, line 2 and the accompanying Figures 1-3 and 6. The vial (181) comprises a top opening (610) having a circumference, a bottom opening (640), a precision bored interior (630) that holds a frit (620), providing a consistent compression and seal with the frit (620) and provides a consistent flow of a reagent solution through the vial (181) during a dispensing and a purging process, a solid support (650) within the vial (181) that is retained above the frit (620) after the purging process and a protruding support (660) that extends along the entire circumference of the top opening (610) of the vial (181) and is configured to form a pressure tight seal directly between the vial (181) and the cartridge (170) when the vial (181) is placed in a cartridge (170), an interior wall, wherein the interior wall linearly tapers from the support to the frit (620) such that the interior wall provides a sole support for the frit (620)

## **VII. GROUND OF REJECTION AND OTHER MATTERS TO BE REVIEWED ON APPEAL**

The following issues are presented in this Appeal Brief for review by the Board of Patent Appeals and Interferences:

1. Whether Claims 27-29, 35-38, 40, 42, 44, 52 and 61 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over McGraw.
2. Whether Claims 27-29, 35, 36, 38, 45-48, 50-54, 56, 57 and 61 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Zuckermann.
3. Whether Claims 27-30, 35, 36, 38, 45-48 and 50-62 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Cargill.

## **VIII. ARGUMENT**

### *Grounds for Rejection*

Within the Office Action, Claims 27-29, 35-38, 40, 42, 44, 52 and 61 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over McGraw.

*Outline of Arguments*

In the discussion that follows, the Appellants discuss the teachings of McGraw. As will be discussed below McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit and *In re Dailey* does not apply because such a difference is not a mere change in shape. Further as described below, even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering is not obvious. Moreover as described below, McGraw does not teach a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge, or each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge. Accordingly, McGraw does not teach the presently claimed invention.

1. McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit or wherein the outer wall continuously tapers from the top opening to the bottom opening and *In re Dailey* does not apply because such a difference is not a mere change in shape.

McGraw is directed to an apparatus and method for the automated synthesis of DNA segments utilizing multiple reaction columns. [McGraw, Abstract] Specifically, McGraw teaches that a column 11 is inserted into a Luer fitting 15, which has previously been inserted into a bulkhead 16. Within the Office Action of March 4, 2010, it is recognized that McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit. However, also within the Office Action of March 4, 2010, it is asserted that this difference of “linearly tapering” between the prior art and the presently claimed invention is one of shape as described in *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966), where the court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. [Office Action of March 4, 2010, pages 4-5] Specifically, it is asserted that McGraw teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same *function* of retaining a solid support and frit on a narrowed portion inside the vial. The Office Action of March 4, 2010 then continues by concluding that the different tapering shape was a matter of choice which a person of ordinary skill in the art

would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Appellant respectfully disagrees because 1) the small narrowed portion of McGraw below frit 9 does not provide the same function of retaining a solid support and the frit and 2) *In re Dailey* did not relate to all types of changes in shape, but only a simple change in the magnitude of a shape and is thus inapplicable here.

Firstly, the small narrowed portion of McGraw below frit 9 does not provide the function of retaining a solid support and the frit. Instead, McGraw teaches that a support 100 is used for supporting the frits and any solid within the reaction column 11. [McGraw, col. 5, lines 52-55] Indeed, McGraw teaches that the only purpose of the tapering of McGraw is to provide a conically-shaped outlet end for insertion into a mating Luer fitting 15. [McGraw, col. 5, lines 51-52] As a result, it is clear that the tapered portion of McGraw is not only different than the presently claimed invention, but it also serves an entirely different function.

Within the Office Action, it is stated that “[t]he narrow portion of McGraw holds the lower frit (9) - which holds the support (100) and the upper frit (9A).” [Office Action of February 15, 2011, page 6] In other words, it is asserted that the tapered portion of McGraw *indirectly* supports the frit (by supporting the actual support 100). The Office Action then concludes that such a teaching of indirect support is sufficient to teach that the tapered portion of McGraw has the same function as the tapered portion in the presently claimed invention. The Appellants respectfully disagree. It first should be noted that nowhere in Figure 6 nor the remainder of McGraw does it teach that “the narrowed portion holds the support which holds the frit” as asserted within the Office Action. Contrarily, upon observation of Figure 6 of McGraw it is clear that the narrowed portion makes no contact with the support 100, much less does the narrowed portion hold the support 100. Furthermore, even if the narrowed portion did hold the support 100, that is not the same as supporting the frit itself. The function of 1) holding the support 100 is a distinct function than that of 2) supporting the frit, and nothing in McGraw indicates otherwise. As a result, despite the assertions within the Office Action, the fact remains that as explicitly taught within McGraw, support 100 provides the function of supporting the frits, not the tapered portion. Accordingly, the tapered portion of McGraw does not provide the same function as the tapered portion of the presently claimed invention.

Secondly, *In re Dailey* did not relate to any change in shape, but rather only to a simple change in the magnitude/degree of a shape and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of a sphere that was smaller than a hemisphere, wherein the prior art

included a curved lower portion in the same position that was a full hemisphere. *In re Dailey*, 357 F.2d at 670. Thus, the only difference was a matter of degree or magnitude of the curvature of the lower portion. Contrarily, in this case, the prior art does not merely lack a degree of the interior wall tapering from the exterior support to the frit. Instead, McGraw lacks any tapering at all between the top portion and the frits 9, 9a. [McGraw, Fig. 6] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and McGraw are not a mere matter of degree. Indeed, it should be noted that a “difference in degree” is not the same as a “difference in position”. For example, no matter how much one changed the *degree* of the taper in McGraw, the taper would still fail to be located between the top portion and the frit because a change in *degree* is not the same as a change in *location*. In other words, because the minimal tapering in McGraw is found in a different position (i.e. below the frit) than in the presently claimed invention, a change in the degree of McGraw’s taper will always be limited to a teaching of a lesser or greater taper that is still in a different position than the presently claimed invention.

Within the Office Action of February 15, 2011, it is asserted that the taper in McGraw is not in a different position than in the presently claimed invention, but instead McGraw teaches that “rather than tapering from the top to the bottom of the vial, the vial simply tapers at the bottom to a degree that is different from that of Applicant - but it still holds the frit in place.” [Office Action of February 15, 2011, page 7] The Appellants respectfully disagree. Even as described in the Office Action, it is apparent that the difference found in McGraw refers to a difference in position, not merely a difference in degree. Specifically, as quoted above, the Office Action states that the position at which the vial in McGraw tapers is “at the bottom” of the vial wherein this “at the bottom” language is clearly referring to a position of the tapering not to a degree of tapering. Therefore, even if McGraw also teaches a difference in degree of taper, its clear difference in the position of the taper distinguishes it from the circumstances found in *In re Dailey*. In other words, simply because the taper of McGraw differs from the presently claimed taper in *both* degree and position, does not mean that *In re Dailey* applies. Instead, the fact remains that McGraw does not teach a taper of any kind from the exterior dimension/protruding support to the frit as required by the presently claimed limitations. Therefore, any introduction of a taper into that area must involve a change in location. As a result, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and McGraw are not a mere matter of degree or magnitude.

Accordingly, because 1) McGraw's end taper has a different function than the presently claimed invention and because 2) *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between McGraw and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

2. Even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering is not obvious.

As described above, within the Office Action of March 4, 2010, it is asserted that the differences between the prior art and the presently claimed invention is one of shape as described in *In re Dailey*. However, *In re Dailey* teaches that its holding regarding the obviousness of changes of shape requires the case be "absent persuasive evidence that the particular configuration of the claimed container was significant." *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). In this case, there is ample persuasive evidence that the linearly tapering is significant such that it is not properly determined under *In re Dailey* to be obvious as a mere change in shape.

Specifically, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that "[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes." [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Further, the tapered configuration is also key/significant to the presently claimed invention's ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit as shown in Figure 6. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650 above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

Indeed, this significance to the tapering of the presently claimed invention is in contrast to the limited tapering in McGraw, which is too low to have any significant sealing effect on the frit because the supporting member 100 prevents any compression against the tapered portion from occurring. [See McGraw, Fig. 6] Furthermore, even if McGraw's tapered portion were allowed to be pressed against the frit, due to the extreme angle of the tapering, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit and the support 100 along the side walls, possibly only traversing through the lower frit at the very edge where some upward pressure might be applied. Consequently, McGraw's configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of McGraw does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is taught within the Present Specification that "[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and

provides a pressure tight seal around each vial within the cartridge 170.” [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper, substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole. Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted into the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, at least a portion of its body would be exposed to potential harm above the surface of the cartridge. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial.

Contrarily, because McGraw only tapers at the very end of the chamber 11 in order to fit within the Luer fitting 15, the majority of the vial must remain *exposed* outside the protection of the bulkhead 16. [McGraw, Fig. 6] Thus, unlike the presently claimed invention, the tapering of McGraw is not able to perform the function of permitting the chamber 11 to be fully protected within the bulkhead 16 and thus more likely to be disturbed or damaged. Therefore again, the tapered portion of McGraw does not have the same significance or function of that of the presently claimed invention.

Within the Office Action of February 15, 2011, it is asserted that page 14, lines 3-6 do not relate to the taper of the vial and instead are simply directed to the bored interior of the vial. [Office Action, page 7] However, one skilled in the art would recognize that the “bored interior of the vial” is what makes up the interior tapering. Specifically, the “bored interior” refers to the inner walls of the vial which also form the interior taper of the vial. As a result, the benefits/significance described as being derived from the bored interior are also inherently derived from the interior taper that forms the bored interior. Thus, the significance described on page 14, lines 3-6 of the Present Specification does relate to the taper of the vial. Similarly, within the Office Action of February 15, 2011, it is also asserted that page 14, lines 7-9 do not relate to the taper of the vial such that “Applicant’s arguments are beyond the scope of [the] passage.” [Office Action, page 8] However, similar to above, one skilled in the art would understand that the “exterior of each vial” described in the passage is formed by the exterior



tapering of the vial. Thus, again, although the passage does not use the term “exterior taper,” it is still referring to the significance derived from said taper.

Finally within the Office Action of February 15, 2011, it is asserted that “[t]he issue is whether the vial having a different shape can still retain the frit.” [Office Action, page 8] However, that is not the issue at hand. Rather, the issue of the present section is whether the taper of the presently claimed invention is significant such that it can overcome an *In re Dailey* rejection. As such, all functions provided by the taper are able to add to its significance including both its use in supporting the frit and the use in maintaining a consistent flow described above. Whether a vial having a different shape can still retain a frit is not important to this section as it does not in any way discount the significance of the taper of the presently claimed invention as described above. Thus, again, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit. Accordingly, even if *In re Dailey* did apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

3. McGraw does not teach a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge or each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge.

Again, McGraw is directed to an apparatus and method for the automated synthesis of DNA segments utilizing multiple reaction columns. [McGraw, Abstract] Specifically, McGraw teaches that a column 11 is inserted into a Luer fitting 15, which has previously been inserted into a bulkhead 16. However, McGraw does not teach a support or exterior dimension configured to provide a pressure-tight seal as claimed. In particular, McGraw does not teach a *direct* fit between the column 11 and the bulkhead 16, nor does McGraw teach a support that produces a pressure-tight seal. As discussed thoroughly below, and evidenced by Figure 6, the support for the reaction column 11 is provided by the Luer fitting 15 which is fitted into the bulkhead. Additionally, as is well known in the art, Luer fittings have a male and female component that are joined to form a connection. As particularly demonstrated by Figure 6, the male end of the column 11 is inserted into the Luer fitting 15 which is inserted into the bulkhead

16. Therefore, clearly, McGraw does not teach a *vial* comprising a support with a precise dimension, rather it teaches using a Luer fitting for this purpose.

A close-up view of the reaction column 11 taught by McGraw is shown in Figure 2. [McGraw, col. 5, lines 49-52, Figure 2] McGraw teaches that a Luer fitting 15 is fitted into a bulkhead 16. [McGraw, col. 5, lines 45-52, Figures 5 and 6] McGraw then teaches that the column 11 is inserted into the Luer fitting 15. [McGraw, col. 5, lines 51-52, Figures 5 and 6] McGraw does not teach that the column 11 is fitted directly into a bulkhead 16. Accordingly, McGraw does not teach that a pressure-tight seal is provided **directly** between the column 11 and the bulkhead 16 (i.e. the asserted cartridge and vial). In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16 (i.e. no direct contact or seal). Specifically, with respect to Figure 5, McGraw teaches

[t]he bulkhead 16 is sealed to the top of the solid frame 17' by means of the seal 95 such that the exit basin 17 is not connected to the atmosphere in the reaction chamber 10 except through the *Luer fittings 15 which receive the reaction columns 11*. [McGraw, col. 5, lines 44-48, Figure 5, emphasis added]

Then with respect to Figure 6, McGraw teaches “[t]he column 11 has a conically-shaped outlet end *for insertion into a mating Luer fitting 15*.” [McGraw, col. 5, lines 51-52, Figure 6 (emphasis added)] However, the Luer fitting 15 and the bulkhead 16 are not one entity. Luer fittings 15 are a completely independent component, separate from the bulkhead 16. Indeed, although Figure 5 shows the Luer fitting 15 extending through the bulkhead 16, that does not make the two components one. As a result, it is clear that the Luer fitting 15 of McGraw is inserted into the bulkhead 16 and then the column 11 is inserted into the Luer fitting 15 (not into the bulkhead 16 itself). Consequently, McGraw teaches a column 11 being inserted into a Luer fitting 15 which is connected to a bulkhead 16. Thus, there is no *direct* contact between the column 11 and the bulkhead 16. Accordingly, McGraw does not teach that a pressure-tight seal is provided *directly* between the column and a cartridge, since for a seal to be *directly* between the column 11 and cartridge 16 nothing can be in between. Therefore, McGraw does not teach a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge or each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge.

4. The claims distinguish over McGraw.

The claims are grouped separately below to indicate that they do not stand or fall together.

a. Claims 27, 28 and 40

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. Further, McGraw does not teach that a solid support is retained within the vial **directly** above a frit or a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 27 is allowable over the teachings of McGraw.

Claims 28 and 40 are both dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of McGraw. Accordingly, the Claims 28 and 40 are both also allowable as being dependent on an allowable base claim.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises “an exterior dimension to fit directly within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge.” As discussed above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. In contrast, McGraw teaches that the column 11 is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided **directly** between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. For at least this additional reason, the Claim 28 is allowable over the teachings of McGraw.

b. Claims 29 and 42

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, McGraw does not teach that a pressure-tight seal is provided *directly* between the column and a cartridge. As further discussed above, McGraw does not teach that a solid support is retained within the vial above a frit or that the vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 29 is allowable over the teachings of McGraw.

Claim 42 is dependent on the independent Claim 29. As described above, the independent Claim 29 is allowable over the teachings of McGraw. Accordingly, the Claim 42 is also allowable as being dependent on an allowable base claim.

c. Claims 35 and 44

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is

inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 35 is allowable over the teachings of McGraw.

Claim 44 is dependent on the independent Claim 35. As described above, the independent Claim 35 is allowable over the teachings of McGraw. Accordingly, the Claim 44 is also allowable as being dependent on an allowable base claim.

d.     Claims 36-38

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprising a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an interior wall, wherein the internal wall linearly tapers from the exterior support to the frit. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is

retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 36 is allowable over the teachings of McGraw.

Claims 37 and 38 are both dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of McGraw. Accordingly, the Claims 37 and 38 are both also allowable as being dependent on an allowable base claim.

e. Claim 52

The independent Claim 52 is directed to a plurality of vials. Each of the plurality of vials of Claim 52 comprise a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 52 is allowable over the teachings of McGraw.

f. Claim 61

The independent Claim 61 is directed to a vial. The vial of Claim 61 comprises a top opening, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process and a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit. As described above, McGraw does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, McGraw does not teach a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process or a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, the independent Claim 61 is allowable over the teachings of McGraw.

*Grounds for Rejection*

Within the Office Action, Claims 27-29, 35, 36, 38, 45-48, 50-54, 56, 57 and 61 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Zuckermann.

*Outline of Arguments*

In the discussion that follows, the Appellants discuss the teachings of Zuckermann. As will be discussed below Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit and *In re Dailey* does not apply because such a difference is not a mere change in shape. Further as described below, even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering is not obvious. Moreover, Zuckermann does not teach that a pressure-tight seal is provided directly between the column and a cartridge or that a vial includes a bored interior having a consistent

dimension to maintain a consistent flow through the bored interior. Accordingly, Zuckermann does not teach the presently claimed invention.

5. Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit and *In re Dailey* does not apply because such a difference is not a mere change in shape.

Zuckermann teaches an actuation means for use in solid phase chemical synthesis involving arrays of modular reaction vessels. The apparatus taught by Zuckermann includes a plurality of reaction vessels arranged in a substantially linear array. [Zuckermann, Abstract] The reaction vessels of Zuckermann include modular valving means capable of being actuated to drain or close each of the reaction vessels in the array. [Zuckermann, Abstract] Specifically, Zuckermann teaches that a plug 28 is connected to a three-way valve 30 via tubing 32 to a source 36 of substantially inert gas. [Zuckermann, col. 3, lines 42-46, Figures 2 and 3] As recognized within the Office Action, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit. However, also within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. [Office Action of March 4, 2010, page 5] Specifically, it is asserted that Zuckermann teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same function of retaining a solid support and frit on a narrowed portion inside the vial. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). It is then concluded within the Office Action that the different tapering shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Appellant respectfully disagrees.

*In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of sphere that was smaller than a hemisphere, wherein the prior art included a curved lower portion that was a full hemisphere. *In re Dailey*, 357 F.2d 669, 670. Thus, the only difference was a matter of degree or magnitude of the curvature of the lower portion. Contrarily, in this case, Zuckermann does not merely lack a degree or magnitude of the interior wall tapering from the exterior support to the frit, Zuckermann lacks any tapering at all between the top portion and the frit 27. [Zuckermann,



Fig. 2] Indeed, the only conceivable tapering of Zuckermann is found below the frit, not between the top portion and the frit 27 where it does not taper at all. Further, even if this lower “tapering” was in the correct portion, it is not linear as it immediately curves instead of narrowing in a line. [See Zuckermann, Fig. 2] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and Zuckermann are not a mere matter of degree or magnitude.

Within the Office Action of February 15, 2011, it is asserted that Zuckermann teaches a difference in degree (not a difference in position) because “rather than tapering from the top to the bottom of the vial, the vial simply tapers at the bottom to a degree that is different from that of the applicant.” [Office Action, page 9] The Appellants respectfully disagree. Even as described in the Office Action, it is apparent that the difference found in Zuckermann refers to a difference in position, not merely a difference in degree. Specifically, it is stated within the Office Action that the position at which the vial in Zuckermann tapers is “at the bottom” of the vial wherein this “at the bottom” language is clearly referring to a position of the tapering not to a degree of tapering. Therefore, even if Zuckermann also teaches a difference in degree of taper, its clear difference in the position of the taper distinguishes it from the circumstances found in *In re Dailey*. Accordingly, because *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Zuckermann and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

6. Even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering is not obvious.

As described above, within the Office Action of March 4, 2010, it is asserted that the differences between the prior art and the presently claimed invention is one of shape as described in *In re Dailey*. However, *In re Dailey* teaches that its holding regarding the obviousness of changes of shape requires the case be “absent persuasive evidence that the particular configuration of the claimed container was significant.” *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). In this case, there is ample persuasive evidence that the linearly tapering is significant such that it is not properly determined under *In re Dailey* to be obvious as a mere change in shape.

Specifically, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that “[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes.” [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Secondly, the tapered configuration is also key/significant to the presently claimed invention’s ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650 above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

This is in contrast to the limited tapering in Zuckermann, which is too short and severe in angle to have any significant sealing effect on the frit because the sides become essentially horizontal so quickly that any significant pinching force is lost. [See Zuckermann, Fig. 2] Indeed, due to the extreme angle of the “tapering” of Zuckermann, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit along the side walls, possibly only traversing through the frit at the very edge where some upward pressure might be applied. Consequently, Zuckermann’s configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of Zuckermann does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is taught within the Present Specification that “[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170.” [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper (even if there was no expansion), substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole. Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted into the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, its body would be exposed to potential harm. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial.

Contrarily, because Zuckermann only tapers at the very end of the vessel 14, in order to fit within a threaded plug 28, the majority of the vial must remain exposed outside the protection of the cleavage vessel platform 12. [Zuckermann, Fig. 2] Thus, unlike the presently claimed invention, the tapering of Zuckermann is not able to perform the function of permitting the vessel 14 to be fully protected within the platform 12 and thus more likely to be disturbed or damaged.

Thus again, the tapered portion of Zuckermann does not have the same significance of that of the presently claimed invention. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

Within the Office Action of February 15, 2011, it is asserted that page 14, lines 3-6 do not relate to the taper of the vial and instead are simply directed to the bored interior of the vial. [Office Action, page 10] However, one skilled in the art would recognize that the “bored interior of the vial” is what makes up the interior tapering. Specifically, the “bored interior” refers to the inner walls of the vial which also form the interior taper of the vial. As a result, the benefits/significance described as being derived from the bored interior are also inherently derived from the interior taper that forms the bored interior. Thus, the significance described on page 14, lines 3-6 of the Present Specification does relate to the taper of the vial. Similarly, within the Office Action of February 15, 2011, it is also asserted that page 14, lines 7-9 do not relate to the taper of the vial such that “Applicant’s arguments are beyond the scope of [the] passage.” [Office Action, page 11] However, similar to above, one skilled in the art would understand that the “exterior of each vial” described in the passage is formed by the exterior tapering of the vial. Thus, again, although the passage does not use the term “exterior taper,” it is still referring to the significance derived from said taper.

Finally, within the Office Action of February 15, 2011, it is asserted that “[t]he issue is whether the vial having a different shape can still retain the frit.” [Office Action, page 10] However, that is not the issue at hand. Rather, the issue of the present section is whether the taper of the presently claimed invention is significant such that it can overcome an *In re Dailey* rejection. As such, all functions provided by the taper are able to add to its significance including both its use in supporting the frit and the use in maintaining a consistent flow described above. Whether a vial having a different shape can still retain a frit is not important to this section as it does not in any way discount the significance of the taper of the presently claimed invention as described above. Thus, again, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

7. Zuckermann does not teach a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge or each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge.

As described above, Zuckermann teaches an actuation means for use in solid phase chemical synthesis involving arrays of modular reaction vessels. The apparatus taught by Zuckermann includes a plurality of reaction vessels arranged in a substantially linear array. [Zuckermann, Abstract] The reaction vessels of Zuckermann include modular valving means capable of being actuated to drain or close each of the reaction vessels in the array. [Zuckermann, Abstract] Specifically, Zuckermann teaches that a plug 28 is connected to a three-way valve 30 via tubing 32 to a source 36 of substantially inert gas. [Zuckermann, col. 3, lines 42-46, Figures 2 and 3] However, Zuckermann does not teach each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge. Moreover, Zuckermann does not teach or make obvious a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, Zuckermann does not teach the presently claimed invention.

In contrast to the teachings of Zuckermann, the vial of the presently claimed invention includes a support held within the vial directly above a frit. [Present Specification, page 3, lines 24-25] The interior of each vial is precision bored to ensure a tight consistent seal with the corresponding frit. [Present Specification, page 3, lines 25-27] The vials are held within a cartridge. [Present Specification, page 3, lines 15-16] The exterior of each vial also has a precise dimension to consistently fit within the cartridge and provide a pressure tight seal around each vial directly within the cartridge. [Present Specification, page 3, line 27 - page 4, line 2] As discussed above, Zuckermann does not teach or make obvious that a pressure-tight seal is provided directly between the column and a cartridge or a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge.

8. The claims distinguish over Zuckermann.

The claims are grouped separately below to indicate that they do not stand or fall together.

a.     Claims 27 and 28

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. Further, Zuckermann does not teach that a solid support is retained within the vial **directly** above a frit. For at least these reasons, the independent Claim 27 is allowable over the teachings of Zuckermann.

Claim 28 is dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Zuckermann. Accordingly, the Claim 28 is also allowable as being dependent on an allowable base claim.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises “an exterior dimension to fit directly within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge.” As discussed above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. For at least this additional reason, the Claim 28 is allowable over the teachings of Zuckermann.

b.     Claim 29

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior

linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 29 is allowable over the teachings of Zuckermann.

c. Claim 35

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As described above, Zuckermann does not teach wherein the outer wall continuously tapers from the top opening to the bottom opening, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 35 is allowable over the teachings of Zuckermann.

d. Claims 36 and 38

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprising a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 36 is allowable over the teachings of Zuckermann.

Claim 38 is dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of Zuckermann. Accordingly, the Claim 38 is also allowable as being dependent on an allowable base claim.

e. Claim 45

The independent Claim 45 is directed to a vial including an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after



the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial **directly** above a single frit. For at least these reasons, the independent Claim 45 is allowable over the teachings of Zuckermann.

f. Claim 46

The independent Claim 46 is directed to a vial including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 46 is allowable over the teachings of Zuckermann.

g. Claim 47

The independent Claim 47 is directed to a vial. The vial of Claim 47 comprises an interior wall, a bored interior having a consistent dimension, a material for growing a polymer chain and a frit for retaining the material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure

differential to expel material from the vial and a *solid support* retained within the vial above the frit after the flushing procedure, the vial consisting essentially of a single frit, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial **directly** above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 47 is allowable over the teachings of Zuckermann.

h. Claim 48

The independent Claim 48 is directed to a vial. The vial of Claim 48 comprises an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit without any additional frits and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 48 is allowable over the teachings of Zuckermann.

i. Claim 50

The independent Claim 50 is directed to a plurality of vials each comprising an interior wall and a bored interior having a consistent dimension to hold a frit, wherein the consistent

dimension is consistent for each of the plurality of vials, each of the vials consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 50 is allowable over the teachings of Zuckermann.

j. Claim 51

The independent claim 51 is directed to a plurality of vials each comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, each of the plurality of vials further comprising a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 51 is allowable over the teachings of Zuckermann.

k. Claim 52

The independent Claim 52 is directed to a plurality of vials. Each of the plurality of vials of Claim 52 comprise a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 52 is allowable over the teachings of Zuckermann.

l. Claims 53 and 54

The independent Claim 53 is directed to a plastic vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the

bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit or a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 53 is allowable over the teachings of Zuckermann.

Claim 54 is dependent on the independent Claim 53. As described above, the independent Claim 53 is allowable over the teachings of Zuckermann. Accordingly, the Claim 54 is also allowable as being dependent on an allowable base claim.

m. Claims 56 and 57

The independent Claim 56 is directed to a plastic vial comprising a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. Zuckermann also does not teach a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 56 is allowable over the teachings of Zuckermann.

Claim 57 is dependent on the independent Claim 56. As described above, the independent Claim 56 is allowable over the teachings of Zuckermann. Accordingly, the Claim 57 is also allowable as being dependent on an allowable base claim.

n. Claim 61

The independent Claim 61 is directed to a vial. The vial of Claim 61 comprises a top opening, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process and a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit. As described above, Zuckermann does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Zuckermann does not teach a precision bored interior that holds a frit, a solid support within the vial that is retained above the frit after the purging process or a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, the independent Claim 61 is allowable over the teachings of Zuckermann.

*Grounds for Rejection*

Within the Office Action, Claims 27-30, 35, 36, 38, 45-48 and 50-62 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cargill.

*Outline of Arguments*

In the discussion that follows, the Appellants discuss the teachings of Cargill. As will be discussed below Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, or a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening and *In re Dailey* does not apply because such a difference is not a mere change in shape. Further as described below, even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering

is not obvious. Moreover as described below, Cargill does not teach a protruding support that extends along the entire circumference of the top opening and *In re Dailey* does not apply because such a difference is not a mere change in shape. Additionally as described below, even if *In re Dailey* does apply, there is persuasive evidence that the extension of the protruding support of the presently claimed invention is significant such that even under *In re Dailey* the extension of the protruding support is not obvious. Finally as described below, Cargill does not teach wherein the interior wall provides the sole support for the frit. Accordingly, Cargill does not teach the presently claimed invention.

9. Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit or a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening and *In re Dailey* does not apply because such a difference is not a mere change in shape.

Cargill teaches methods and apparatus for the generation of chemical libraries. Cargill teaches that reaction chambers 110 include a body portion 112 having a top opening 118 and a gas input port 122. [Cargill, col. 7, lines 45-56, Figure 2A] Cargill also teaches that a lower portion 114 of the reaction chamber 110 can receive a frit 124. [Cargill, col. 7, lines 65-67, Figure 2A] The reaction chamber 110 of Cargill also includes a funnel portion 130 and a generally cylindrical drain tube 132, which includes an annular sealing bead 134 to create a seal against the outside of an S-shaped trap tube 136. [Cargill, col. 8, lines 11-21, Figures 2A and 3] Cargill teaches that the trap tube 136 connects to a drain tube 138 such that when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. [Cargill, col. 8, lines 23-29, Figures 2A and 3] Within the Office Action of March 4, 2010, it is recognized that Cargill does not teach 1) wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit or a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. However, also within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. [Office Action of March 4, 2010, page 6] Specifically, it is asserted that Cargill teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same *function* of retaining a solid support and frit on a narrowed portion inside the vial. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). The Office Action then continues by concluding that the

different tapering shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Appellant respectfully disagrees because 1) the narrowed portion of Cargill does not provide the same function of retaining a solid support and the frit and 2) *In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here.

Firstly, in contrast to the assertions within the Office Action, the small narrowed/tapered portion 116, 130 of Cargill below frit 124 does not provide the function of retaining a solid support and the frit. Instead, Cargill explicitly teaches that an annular bead 126 is used to retain/support the frit 124. [Cargill, col. 8, lines 8-10] Indeed, Cargill teaches that the only purpose of the funnel shaped portion 130 of Cargill is to allow full area exposure to the underside of the frit 124, to enhance the draining of liquids from the reaction chamber 110 (i.e. not to support the frit). [Cargill, col. 8, lines 11-15] Thus, it is evident that the annular bead provides the support for the frit, not the funnel shaped portion 130. Additionally, it should be noted that although the Office Action uses the language of a “narrowed portion,” the claimed limitation requires the function of retaining the solid support is provided by the linear tapering, not mere narrowing. As a result, although the annular bead 126 does provide a “narrow portion,” it does not taper nor is it part of a linearly tapering region. Indeed, even if construed to be a tapering portion, it is clearly not linearly tapering (as its bead structure does not protrude linearly). Accordingly, it is clear that the tapered portion of Cargill is not only different than the presently claimed invention, but it also serves an entirely different function.



Secondly, *In re Dailey* did not relate to any change in shape, but only a simple change in degree and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of sphere that was smaller than a hemisphere, wherein the prior art included a curved lower portion that was a full hemisphere. *In re Dailey*, 357 F.2d 669, 670. Thus, the only difference was a matter of degree/magnitude of the curvature of the lower portion. Contrarily, in this case, the prior art does not merely lack a degree of the interior wall tapering from the exterior support to the frit, Cargill lacks any tapering at all between the top portion and the frit. [Cargill, Fig. 2A] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and Cargill are not a mere matter of similar degree. Accordingly, because 1) Cargill's end taper has a different function than the presently claimed invention and because 2) *In re Dailey* applies to mere changes in the degree of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Cargill and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

Within the Office Action of February 15, 2011, it is asserted that Cargill teaches a difference in degree (not a difference in position) because "the vial simply tapers at the bottom to a degree that is different from that of the applicant." [Office Action, page 12] The Applicants respectfully disagree. Even as described in the Office Action, it is apparent that the difference found in Cargill refers to a difference in position, not merely a difference in degree. Specifically, it is stated within the Office Action that the position at which the vial in Cargill tapers is "at the bottom" of the vial wherein this "at the bottom" language is clearly referring to a position of the tapering not to a degree of tapering. Therefore, even if Cargill also teaches a difference in degree of taper, its clear difference in the position of the taper distinguishes it from the circumstances found in *In re Dailey*. Accordingly, because *In re Dailey* applies to mere changes in the degree of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Cargill and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

10. Even if *In re Dailey* does apply, there is persuasive evidence that the linearly tapering of the presently claimed invention is significant such that even under *In re Dailey* the linearly tapering is not obvious.

As described above, within the Office Action of March 4, 2010, it is asserted that the differences between the prior art and the presently claimed invention is one of shape as described in *In re Dailey*. However, *In re Dailey* teaches that its holding regarding the obviousness of changes of shape requires the case be “absent persuasive evidence that the particular configuration of the claimed container was significant.” *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). In this case, there is ample persuasive evidence that the linearly tapering is significant such that it is not properly determined under *In re Dailey* to be obvious as a mere change in shape.

Specifically, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that “[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes.” [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Additionally, the tapered configuration is also key/significant to the presently claimed invention’s ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a

correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650 above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

This is in contrast to the limited tapering in Cargill, which is too low to have any significant sealing effect on the frit because the annular bead 126 prevents any compression against the tapered portion 130 from occurring. [See Cargill, Fig. 2A] Furthermore, even if Cargill's tapered portion 130 was allowed to be pressed against the frit, due to the extreme angle of the tapering, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit and the support 100 along the side walls, possibly only traversing through the frit at the very edge where some upward pressure might be applied. Consequently, Cargill's configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of Cargill does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is taught within the Present Specification that "[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170." [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper (even if there was no expansion), substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole.

Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted into the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, its body would be exposed to potential harm. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

Within the Office Action of February 15, 2011, it is asserted that page 14, lines 3-6 do not relate to the taper of the vial and instead are simply directed to the bored interior of the vial. [Office Action, page 13] However, one skilled in the art would recognize that the “bored interior of the vial” is what makes up the interior tapering. Specifically, the “bored interior” refers to the inner walls of the vial which also form the interior taper of the vial. As a result, the benefits/significance described as being derived from the bored interior are also inherently derived from the interior taper that forms the bored interior. Thus, the significance described on page 14, lines 3-6 of the Specification does relate to the taper of the vial. Similarly, within the Office Action of February 15, 2011, it is also asserted that page 14, lines 7-9 do not relate to the taper of the vial such that “Applicant’s arguments are beyond the scope of [the] passage.” [Office Action, pages 13-14] However, similar to above, one skilled in the art would understand that the “exterior of each vial” described in the passage is formed by the exterior tapering of the vial. Thus, again, although the passage does not use the term “exterior taper,” it is still referring to the significance derived from said taper.

Finally, within the Office Action of February 15, 2011, it is asserted that “[t]he issue is whether the vial having a different shape can still retain the frit.” [Office Action, page 13] However, that is not the issue at hand. Rather, the issue of the present section is whether the taper of the presently claimed invention is significant such that it can overcome an *In re Dailey* rejection. As such, all functions provided by the taper are able to add to its significance including both its use in supporting the frit and the use in maintaining a consistent flow described above. Whether a vial having a different shape can still retain a frit is not important to this section as it does not in any way discount the significance of the taper of the presently claimed invention as described above. Thus, again, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

11. Cargill does not teach a protruding support that extends along the entire circumference of the top opening and *In re Dailey* does not apply because such a difference is not a mere change in shape.

Within the Office Action of February 15, 2011, it is recognized that Cargill does not teach a protruding support that extends along the entire circumference of the top opening. However, also within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. Specifically, it is asserted that Cargill teaches a vial having a protruding support with a different shape than the protruding support on the vial of the instant claims (see Figure 2A), but still provides the same function of “providing a pressure tight seal by ensuring that the vial is inserted properly into the cartridge. See column 7, lines 60-64 and column 10, lines 32-45 of Cargill.” [Office Action of February 15, 2011, pages 11-12] The Appellant respectfully disagrees because 1) the keying protrusion 128 of Cargill does not provide the same function as the protruding support of the presently claimed invention and 2) the extension of the protruding support is not a mere change in magnitude.

Firstly, although it is asserted within the Office Action that the keying protrusion 128 of Cargill provides the function of “providing a pressure tight seal,” the cited portions of Cargill provide no support for this assertion. Instead, Cargill teaches a vial (i.e. vessel 110) having a keying protrusion 128 that is only positioned on a small sliver of the circumference of the top of the vessel 110 and that the purpose of the “[k]eying protrusion 128 [is to prevent the] reaction chamber 110 from being inserted into reaction block 140 unless it is in a predetermined orientation.” [Cargill, Figure 2A and col. 7, lines 60-64 and col. 10, lines 32-37] Specifically, the cited portion of Cargill states:

Reaction chamber 110 preferably also includes a keying protrusion 128. Keying protrusion 128 prevents reaction chamber from being inserted into reaction block 140 unless it is in a *predetermined orientation*. This feature will be discussed further below. [Cargill, col. 7, lines 60-64 (emphasis added)]

and,

As discussed above, reaction chambers 110 and openings 144 are preferably ‘keyed’ with keying protrusions 128 and keying notches 145, respectively. This prevents reaction chambers 110 from being inserted fully into openings 144 unless the reaction chambers are in a *predetermined proper orientation*. In a preferred embodiment, reaction chambers

110 are oriented such that gas inlet ports 122 face away from chamber exit ports 154A-D. This prevents back flow of liquids from reaction chambers 110 into the chamber exit ports 154A-D. In addition, gas inlet ports 122 of reaction chambers 110 are oriented such that a back flow of liquid from one reaction chamber 110 is prevented from spilling directly into the gas inlet port 122 of an adjoining reaction chamber 110. [Cargill, col. 10, lines 32-45 (emphasis added)]

Therefore, it is evident that nowhere does the cited portion of Cargill teach that the keying protrusions 128 provide the function of air tight sealing as asserted within the Office Action. Instead, the passages clearly teach that the protrusion's purpose is to ensure proper orientation such that the inlet and outlet ports line up properly. Indeed, one skilled in the art would recognize that because the keying protrusion 128 that is only positioned on a small sliver of the circumference of the top of the vessel 110 it is impossible for it to provide the function of a pressure tight seal along the entire circumference of the top of the vial. [See Cargill, Fig. 2A] Moreover, the purpose of the keying protrusion 128 would be defeated if it extended along the entirety of the circumference of the top opening (because then it would no longer be a "sliver" and thus no longer able to ensure the orientation of the reaction chamber 110). [See Cargill, col. 7, lines 60-64] In sum, not only does the slivered keying protrusion 128 only function to ensure orientation, it cannot be modified to provide the asserted sealing function without losing its ability to ensure orientation. Accordingly, it is abundantly clear that the keying protrusion 128 of Cargill does not provide the same function as the protruding support of the presently claimed invention.

Secondly, as described above, *In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here. Specifically, in this case, the prior art does not merely lack a degree or magnitude of positioning of the protrusion around the entire circumference of the top opening, Cargill lacks any protrusion around the entire circumference of the top opening. [Cargill, Fig. 2A] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and Cargill are not a mere matter of similar degree or magnitude. Accordingly, because 1) Cargill's keying protrusion 128 has a different function than the presently claimed invention and because 2) *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Cargill and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

12. Even if *In re Dailey* does apply, there is persuasive evidence that the protruding support around the circumference of the top opening of the presently claimed invention is significant such that even under *In re Dailey* the protruding support is not obvious.

As described above, it is asserted that the differences between the prior art and the presently claimed invention is one of shape as described in *In re Dailey*. However, *In re Dailey* teaches that its holding regarding the obviousness of changes of shape requires the case be “absent persuasive evidence that the particular configuration of the claimed container was significant.” *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). In this case, there is ample persuasive evidence that the protruding support along the entire circumference of the top opening is significant such that it is not properly determined under *In re Dailey* to be obvious as a mere change in shape.

Specifically, the Present Specification teaches that “[t]he support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170.” [Present Specification, page 14, lines 7-9] Thus, the configuration of the protrusion extending around the entire circumference of the top of the vial is significant in that it is what enables a pressure tight seal to be formed. This is critical to the operation of the cartridge because the evacuation method is based on a pressure differential that could not be produced without the pressure tight seal formed by the protruding support. Indeed, one skilled in the art would understand that the protrusion would need to be around the circumference or else the seal would be broken. Again, in contrast, the keyed protrusion 128 of Cargill is only a sliver touching a small portion of the top of the vessel of Cargill. Thus, even if *In re Dailey* did apply, the particular configuration of the protruding support of the presently claimed invention is significant.

13. Cargill does not teach wherein the interior wall provides the sole support for the frit.

Cargill does not teach wherein the interior wall provides the sole support for the frit. Instead, within the Office Action of February 15, 2011 it is admitted that the interior wall of Cargill is not the sole support for the frit. Specifically, it is stated within the Office Action that “[t]he Examiner ... directs Applicant to Figure 2A of Cargill which shows the frit (124) *retained by the narrow portion (annular bead - 126)* and the tapered bottom of the vial.” [Office Action of February 15, 2011, page 12] Thus, because it is admitted that the annular bead 126 supports the

frit, Cargill clearly cannot teach that the interior wall is the sole support for the frit. Accordingly, Cargill does not teach wherein the interior wall provides the sole support for the frit.

14. Cargill does not teach a support that provides a pressure tight seal around the vial when the vial is placed in a cartridge or each vial comprising an exterior dimension to fit directly within a corresponding receiving hole thereby providing a pressure-tight seal directly between the vial and the cartridge.

As described above, Cargill teaches methods and apparatus for the generation of chemical libraries. Cargill teaches that reaction chambers 110 include a body portion 112 having a top opening 118 and a gas input port 122. [Cargill, col. 7, lines 45-56, Figure 2A] Cargill also teaches that a lower portion 114 of the reaction chamber 110 can receive a frit 124. [Cargill, col. 7, lines 65-67, Figure 2A] The reaction chamber 110 of Cargill also includes a funnel portion 130 and a generally cylindrical drain tube 132, which includes an annular sealing bead 134 to create a seal against the outside of an S-shaped trap tube 136. [Cargill, col. 8, lines 11-21, Figures 2A and 3] Cargill teaches that the trap tube 136 connects to a drain tube 138 such that when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. [Cargill, col. 8, lines 23-29, Figures 2A and 3] However, Cargill also does not teach that a pressure-tight seal is provided **directly** between a column and a cartridge. Further, Cargill does not teach a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Instead, Cargill teaches that a frit 124 is press fit into the lower portion 114 of the reaction chamber 110. [Cargill, col. 8, line 5] The lower portion 114 also includes an annular bead 126 to retain the frit 124 when it is pressed into place. [Cargill, col. 8, lines 8-10] Thus, Cargill does not teach a precision bored interior that holds a frit, providing a consistent compression and seal with the frit. Particularly, Cargill cannot teach that the interior of the reaction chamber 110 provides a consistent compression and seal with the frit 124 because any consistent compression and seal with the frit is disrupted by the annular bead 126 which retains the frit 124 when it is pressed into place.

In contrast to the teachings of Cargill, the vial of the presently claimed invention includes a support held within the vial directly above a frit. [Present Specification, page 3, lines 24-25] The interior of each vial is precision bored to ensure a tight consistent seal with the corresponding frit. [Present Specification, page 3, lines 25-27] The vials are held within a cartridge. [Present Specification, page 3, lines 15-16] The exterior of each vial also has a precise dimension to consistently fit within the cartridge and provide a pressure tight seal around each



vial **directly** within the cartridge. [Present Specification, page 3, line 27 - page 4, line 2] As discussed above, Cargill does not teach or make obvious that a pressure-tight seal is provided directly between the column and a cartridge. As further discussed above, Cargill does not teach or make obvious a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Thus, Cargill does not teach or make obvious the presently claimed invention.

15. The claims distinguish over Cargill.

The claims are grouped separately below to indicate that they do not stand or fall together.

a. Claims 27 and 28

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. Further, Cargill does not teach that a solid support is retained within the vial **directly** above a frit. For at least these reasons, the independent Claim 27 is allowable over the teachings of Cargill.

Claim 28 is dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Cargill. Accordingly, the Claim 28 is also allowable as being dependent on an allowable base claim.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises “an exterior dimension to fit directly within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge.” As discussed above, Cargill does not teach that a pressure-tight seal is provided **directly** between

a vial and a cartridge. For at least this additional reason, the Claim 28 is allowable over the teachings of Cargill.

b.     Claims 29 and 30

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 29 is allowable over the teachings of Cargill.

Claim 30 is dependent on the independent Claim 29. As described above, the independent Claim 29 is allowable over the teachings of Cargill. Accordingly, the Claim 30 is also allowable as being dependent on an allowable base claim.

c.     Claim 35

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a

cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As described above, Cargill does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 35 is allowable over the teachings of Cargill.

d.     Claims 36 and 38

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprising a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent

dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 36 is allowable over the teachings of Cargill.

Claim 38 is dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of Cargill. Accordingly, the Claim 38 is also allowable as being dependent on an allowable base claim.

e. Claim 45

The independent Claim 45 is directed to a vial including an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Cargill does not teach that a solid support is retained within the vial **directly** above a single frit. For at least these reasons, the independent Claim 45 is allowable over the teachings of Cargill.

f. Claim 46

The independent Claim 46 is directed to a vial including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In*

*re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 46 is allowable over the teachings of Cargill.

g.      Claim 47

The independent Claim 47 is directed to a vial. The vial of Claim 47 comprises an interior wall, a bored interior having a consistent dimension, a material for growing a polymer chain and a frit for retaining the material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, the vial consisting essentially of a single frit, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Cargill does not teach that a solid support is retained within the vial **directly** above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 47 is allowable over the teachings of Cargill.

h.      Claim 48

The independent Claim 48 is directed to a vial. The vial of Claim 48 comprises an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit without any additional frits and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein

the interior wall linearly tapers from an exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 48 is allowable over the teachings of Cargill.

i. Claim 50

The independent Claim 50 is directed to a plurality of vials each comprising an interior wall and a bored interior having a consistent dimension to hold a frit, wherein the consistent dimension is consistent for each of the plurality of vials, each of the vials consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 50 is allowable over the teachings of Cargill.

j. Claim 51

The independent claim 51 is directed to a plurality of vials each comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, each of the plurality of vials further comprising a bored

interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Cargill does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge, that a solid support is retained within the vial above a single frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 51 is allowable over the teachings of Cargill.

k. Claim 52

The independent Claim 52 is directed to a plurality of vials. Each of the plurality of vials of Claim 52 comprise a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly**

between the column and a cartridge or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. For at least these reasons, the independent Claim 52 is allowable over the teachings of Cargill.

I. Claims 53-55

The independent Claim 53 is directed to a plastic vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further discussed above, Cargill does not teach that a solid support is retained within the vial above a frit or a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 53 is allowable over the teachings of Cargill.

Claims 54 and 55 are dependent on the independent Claim 53. As described above, the independent Claim 53 is allowable over the teachings of Cargill. Accordingly, the Claims 54 and 55 are both also allowable as being dependent on an allowable base claim.

m. Claims 56-58

The independent Claim 56 is directed to a plastic vial comprising a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a



receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. Cargill also does not teach a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 56 is allowable over the teachings of Cargill.

Claims 57 and 58 are dependent on the independent Claim 56. As described above, the independent Claim 56 is allowable over the teachings of Cargill. Accordingly, the Claims 57 and 58 are both also allowable as being dependent on an allowable base claim.

n. Claim 59

The independent Claim 59 is directed to a molded polyethylene compressible vial. The vial of Claim 59 comprises an interior wall and an exterior compressible dimension to compressibly fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. Cargill also does not teach a plastic vial

comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 59 is allowable over the teachings of Cargill.

o.     Claim 60

The independent Claim 60 is directed to a molded polyethylene compressible vial. The vial of Claim 60 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior compressible dimension to compressibly fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge, that a solid support is retained within the vial above a frit or that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. Cargill also does not teach a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 60 is allowable over the teachings of Cargill.

p.     Claim 61

The independent Claim 61 is directed to a vial. The vial of Claim 61 comprises a top opening, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained

above the frit after the purging process and a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. As further described above, Cargill does not teach a precision bored interior that holds a frit, a solid support within the vial that is retained above the frit after the purging process or a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, the independent Claim 61 is allowable over the teachings of Cargill.

q. Claim 62

The independent Claim 62 is directed to a vial. The vial of Claim 62 comprises a top opening having a circumference, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process and a protruding support that extends along the entire circumference of the top opening of the vial and is configured to form a pressure tight seal directly between the vial and the cartridge when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit such that the interior wall provides a sole support for the frit. As described above, Cargill does not teach wherein the bored interior linearly tapers from the exterior dimension/protruding support to the frit, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. Further as described above, Cargill does not teach a protruding support that extends along the entire circumference of the top opening, such a difference is not a mere change in shape under *In re Dailey*, and there is persuasive evidence that the difference is significant. Moreover as described above, Cargill does not teach wherein the interior wall linearly tapers from the support to the frit such that the interior wall provides a sole support for the frit. For at least these reasons, the independent Claim 62 is allowable over Cargill.

16. CONCLUSION

For the above reasons, it is respectfully submitted that the Claims 27-30, 35-38, 40, 42, 44-48 and 50-62 are allowable over the cited prior art references. Therefore, a favorable indication is respectfully requested.

Respectfully submitted,  
HAVERSTOCK & OWENS LLP

Dated: September 1, 2011

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**IX. CLAIMS APPENDIX**

This appendix includes a list of the claims under appeal.

1-26. (canceled).

27. A vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit.

28. The vial according to claim 27 further comprising an exterior dimension to fit directly within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge.

29. A vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit.

30. The vial according to claim 29 consisting essentially of a single frit positioned within the bored interior to retain material within the vial above the frit.

31-34. (canceled).

35. A vial comprising:

- a. a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a

flushing procedure by only forming a pressure differential to expel material from the vial;

- b. a top opening through which material is dispensed into the bored interior;
- c. a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure;
- d. an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening; and
- e. a solid support retained within the vial above the frit after the flushing procedure.

36. A vial comprising:

- a. a frit;
- b. a solid support; and
- c. a body comprising:
  - ii. a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure;
  - iii. a top opening through which material is dispensed into the bored interior;
  - iv. a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure; and
  - v. an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge; and
  - vi. an interior wall;

wherein the interior wall linearly tapers from the exterior support to the frit.

37. The vial as claimed in claim 36 wherein the solid support is controlled pore glass beads.
38. The vial as claimed in claim 36 wherein the material dispensed into the bored interior is a reagent solution.
39. (canceled).
40. The vial as claimed in claim 27 wherein the solid support is controlled pore glass beads.
41. (canceled).
42. The vial as claimed in claim 29 wherein the solid support is controlled pore glass beads.
43. (canceled).
44. The vial as claimed in claim 35 wherein the solid support is controlled pore glass beads.
45. A vial including an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit.
46. A vial including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit.

47. A vial comprising:  
an interior wall;  
a bored interior having a consistent dimension;  
a material for growing a polymer chain; and  
a frit for retaining the material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, the vial consisting essentially of a single frit, wherein the interior wall linearly tapers from an exterior support to the frit.
48. A vial comprising an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit without any additional frits and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit.
49. (canceled)
50. A plurality of vials each comprising an interior wall and a bored interior having a consistent dimension to hold a frit, wherein the consistent dimension is consistent for each of the plurality of vials, each of the vials consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit.
51. A plurality of vials each comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, each of the plurality of vials further comprising a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming



a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit.

52. A plurality of vials, each of the plurality of vials comprising:
- a. a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials;
  - b. a top opening through which material is dispensed into the bored interior;
  - c. a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure;
  - d. an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge;
  - e. a solid support retained within the vial above the frit after the flushing procedure; and
  - f. an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit.
53. A plastic vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit.
54. The plastic vial according to claim 53 wherein the plastic vial is constructed of a polymer.

55. The plastic vial according to claim 54 wherein the polymer comprises polyethylene.
56. A plastic vial comprising:
- a. a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial;
  - b. a top opening through which material is dispensed into the bored interior;
  - c. a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure;
  - d. an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge;
  - e. a solid support retained within the vial above the frit after the flushing procedure; and
  - f. an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit.
57. The plastic vial according to claim 56 wherein the plastic vial is constructed of a polymer.
58. The plastic vial according to claim 57 wherein the polymer comprises polyethylene.
59. A molded polyethylene compressible vial comprising an interior wall and an exterior compressible dimension to compressibly fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit.

60. A molded polyethylene compressible vial comprising:
- a. a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial;
  - b. a top opening through which material is dispensed into the bored interior;
  - c. a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure;
  - d. an exterior compressible dimension to compressibly fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge;
  - e. a solid support retained within the vial above the frit after the flushing procedure; and
  - f. an interior wall, wherein the interior wall linearly tapers from the exterior compressible dimension to the frit.
61. A vial comprising:
- a. a top opening;
  - b. a bottom opening;
  - c. a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process;
  - d. a solid support within the vial that is retained above the frit after the purging process; and
  - e. a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge;
  - f. an interior wall, wherein the interior wall linearly tapers from the support to the frit.
62. A vial comprising:
- a. a top opening having a circumference;
  - b. a bottom opening;

- c. a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process;
- d. a solid support within the vial that is retained above the frit after the purging process; and
- e. a protruding support that extends along the entire circumference of the top opening of the vial and is configured to form a pressure tight seal directly between the vial and the cartridge when the vial is placed in a cartridge;
- f. an interior wall, wherein the interior wall linearly tapers from the support to the frit such that the interior wall provides a sole support for the frit.

**X. EVIDENCE APPENDIX**

**STATEMENT**

Pursuant to 37 C.F.R. § 41.37(c)(1)(ix), the following is a statement setting forth where in the record the evidence of this appendix was entered by the examiner:

<b>Evidence Description:</b>	<b>Where Entered:</b>
U.S. Pat. No. 5,368,823	Office Action mailed June 4, 2004
U.S. Pat. No. 5,240,680	Office Action mailed September 22, 2006
U.S. Pat. No. 5,609,826	Office Action mailed September 22, 2006
Office Action February 15, 2011	Examiner Office Action
Office Action March 4, 2010	Examiner Office Action

**XI. RELATED PROCEEDINGS APPENDIX**

There are no related proceedings.